



Atty. Dkt. No. 017835-0362

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Robert SCHULZ et al.

Title: NANOCOMPOSITES WITH ACTIVATED  
INTERFACES PREPARED BY MECHANICAL  
GRINDING OF MAGNESIUM HYDRIDES  
AND USE FOR HYDROGEN STORAGE

Appl. No.: 09/529,910

Filing Date: 06/28/2000

Examiner: Sikyin Ip

Art Unit: 1742

#13  
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**APPLICANTS' REPLY TO PROTEST FILED UNDER 37 C.F.R. § 1.291(a)**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicants hereby respond to the Protest under 37 CFR 1.291(a) ("Protest") filed on June 21, 2001.

Initially, applicants note that the "publications" submitted in the Protest have already been submitted in an Information Disclosure Statement ("IDS") filed June 28, 2001. As noted in the IDS, applicants do not concede that the documents cited therein are, in fact, prior art against the present application. Applicants do not waive any rights to remove as a reference any documents submitted in the June 28, 2001 IDS.

On page 4 of the Protest, the Protest asserts that the claims of the present application are not patentable over the documents submitted with the Protest and in the June 28<sup>th</sup> IDS. Specifically, the Protest takes the position that the documents submitted describe grinding of magnesium hydride with magnesium-nickel hydride. To further define

the present invention over these documents when they were submitted in the June 28<sup>th</sup> IDS, applicants filed a Preliminary Amendment together with the IDS, which expressly excludes magnesium-nickel hydride.

Second, these references teach little more than what is described in the admitted prior art, namely WO96/23906 described on page 7 of the present application, which corresponds to US Patent No. 5,882,623 ("623 patent"). Document A5 in the June 28<sup>th</sup> IDS may reflect the subject of a meeting held in Henniker, New Hampshire on July 3 to 18, 1997, as pointed out on page 2 of the IDS. The summary of Project No. 8 described in document A5 states:

It was found that ball-milling of magnesium-based hydrides (as opposed to unhydrogenated alloy) results in decreases in the desorption temperature.

This disclosure adds nothing additional than what is disclosed in the '623 patent.

However, one passage of the description of Project No. 8 is described as follows:

More interestingly, ball-milling of the mixtures of  $MgH_2$  and  $Mg_2NiH_4$  gave even more dramatic results. A synergetic effect in the mixture of the two hydride powders result in excellent kinetic properties of the material ... . More studies are required in order to explain this synergy between the components in destabilized mixtures of hydride.

As is readily evident, the only description is exclusively to the fact that ball-milling a mixture of  $MgH_2$  and  $Mg_2NiH_4$ , "facilitates" the hydrogen desorption. There is no disclosure or suggestion in this document that ball-milling a mixture of hydrides specifically tested, i.e.,  $MgH_2$  and  $Mg_2NiH_4$  results in a nanocrystalline structure with an activated

interface as described in the present application at page 13, lines 23 to 28, which leads to superior performance than what was suggested from the research already carried out and previously reported, as set forth on page 10 lines 4 and 5 of the present application. This is true not only for immediate desorption of the hydrogen but also for absorption of the hydrogen. Applicants further point the Examiner to page 13 lines 12 to 19 of the present application, which describes the substantially improved absorption kinetics of nanocomposites according to the present invention. Thus, the documents submitted with the protest and in the June 28<sup>th</sup> IDS do not each or suggest the claimed invention.


At page 5 of the Protest, the Protest alleges that the present inventors did not invent the subject matter disclosed and claimed in the present application, which is the corresponding application to CA 2,217,095 described at page 5 of the protest. As explained above, the disclosures in the documents cited in the Protest and in the June 28<sup>th</sup> IDS basically describe what is disclosed in the '623 patent. The present application is an improvement of what is disclosed in the '623 patent and in the papers submitted in the Protest and in the IDS. Thus, the present inventors are, in fact, the inventors of the presently claimed invention.

Accordingly, applicants submit that the references cited in the protest and in the June 28<sup>th</sup> IDS do not teach or suggest the claimed invention or call into question the inventorship of the present application.

If Examiner Ip has any questions, the Examiner is courteously invited to contact the undersigned at the telephone number shown below.

Respectfully submitted,

Date February 4, 2002

By 

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